STATE OF COLORADO

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WILDLIFE

PLAINS SHARP-TAILED GROUSE RECOVERY PLAN

May 1992

plains sharp-tailed
grouse recovery plan

STATE OF COLORADO

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WILDLIFE

PLAINS SHARP-TAILED GROUSE RECOVERY PLAN

May 1992

Prepared by Recovery Plan Team Members

Clait E. Braun - Terrestrial Wildlife Resources
Robert B. Davies - Southeast Region
James R. Dennis - Northeast Region
Katherine A. Green - Central Region
Judy L. Sheppard - Habitat Resources

Approved _____
Ronald P. Desilet, Southeast Regional Manager

Date 11/19/92

Approved _____
Walt D. Graul, Northeast Regional Manager

Date 11/19/92

Approved _____
John R. Torres, Central Regional Manager

Date Nov. 19 1992

Approved _____
Perry D. Olson, Director, Colorado Division of Wildlife

Date Nov 23, 1992

TABLE OF CONTENTS

TABLE OF CONTENTS i

LIST OF FIGURES AND TABLES ii

EXECUTIVE SUMMARY iii

PREFACE v

ACKNOWLEDGMENTS vii

INTRODUCTION 1

SUBSPECIES DESCRIPTION 2

DISTRIBUTION 3

LIFE HISTORY AND HABITAT REQUIREMENTS 5

FACTORS LEADING TO ENDANGERED STATUS 8

CURRENT STATUS 10

TRANSPLANTS 12

RECOVERY PLAN 13

LITERATURE CITED 30

APPENDIX 35

LIST OF FIGURES AND TABLES

		Page
Fig 1.	Assumed historical and present distribution of plains sharp-tailed grouse in Colorado.	5
Table 1.	Counts of plains sharp-tailed grouse, Douglas County, 1986-91.	12

PLAINS SHARP-TAILED GROUSE RECOVERY PLAN

EXECUTIVE SUMMARY

1. The goal of this recovery plan is to identify steps to ensure survival of plains sharp-tailed grouse as a resident breeding subspecies in Colorado, downlist it from endangered to threatened status on Colorado's state endangered and threatened list by 2008, and delist it to subspecies of special concern by 2023 using the following criteria:
    a. Downlist to threatened status when there are 4 discrete occupied areas of at least 10 mi^2 (25.9 km^2) each of which supports an estimated minimum breeding population of 100 plains sharp-tailed grouse for 3 consecutive years. A discrete area is one that is geographically continuous but at least 20 miles (32.2 km) from the closest occupied area. Portions of at least 2 of the 4 discrete occupied areas will be under management control of the Colorado Division of Wildlife; 2 other areas will be under management control of other private/public entities.
    b. Delist to subspecies of special concern when there are 6 discrete occupied areas of at least 10 mi^2 (25.9 km^2) each of which supports an estimated minimum breeding population of 100 plains sharp-tailed grouse for 3 consecutive years. Portions of at least 3 discrete occupied areas will be under management control of the Colorado Division of Wildlife while at least 3 other areas will be under management control of private/public entities.
2. The current threats to the subspecies are habitat destruction and degradation associated with overgrazing by domestic livestock, human activity, and disturbance.

3. Steps to be done to reach recovery include locating, acquiring, protecting, and maintaining presently occupied habitat, identifying potentially suitable habitats, conducting transplants, identifying and conducting research needed to improve habitat management practices, monitoring populations, and increasing public information.

PREFACE

The Plains Sharp-tailed Grouse Recovery Plan was developed by personnel of the Colorado Division of Wildlife. The recovery plan was distributed for internal and external review, and revised prior to submission to the Director for approval.

The recovery plan is based upon the belief that State and Federal conservation agencies and knowledgeable, interested individuals should endeavor to preserve the plains sharp-tailed grouse and its habitat, and to restore the subspecies to a viable condition. The objective of the plan is to make this belief a reality.

Personnel of the Colorado Division of Wildlife used the best information available to them as well as their collective knowledge and experience in producing this recovery plan. It is hoped the plan will be used by all agencies, institutions, and individuals concerned with plains sharp-tailed grouse to coordinate management and recovery activities. Periodically, and as the plan is implemented, revisions will be necessary. Revisions and implementation will be the responsibility of the Colorado Division of Wildlife.

This completed Plains Sharp-tailed Grouse Recovery Plan has been approved by the Colorado Division of Wildlife. The plan does not necessarily represent official positions or approvals of cooperating agencies and does not necessarily represent the views of all personnel of the Colorado Division of Wildlife. This plan is subject to modification resulting from new findings and changes in subspecies status, and completion of tasks assigned in the plan. Goals and objectives will be attained and funds expended contingent upon appropriations, priorities, and other budgetary constraints.

The literature citation should read as follows:

Braun, C. E., R. B. Davies, J. R. Dennis, K. A. Green, and J. L. Sheppard. 1992. Plains Sharp-tailed Grouse Recovery Plan. Colorado Div. Wildl., Denver. 61 pp.

Additional copies may be obtained from:

Colorado Division of Wildlife
6060 Broadway
Denver, CO 80216
(303) 291-7348

INTRODUCTION

Plains sharp-tailed grouse (Tympanuchus phasianellus jamesi) were thought to have been distributed throughout much of what is now eastern Colorado (Aldrich 1963). Populations and distribution of this subspecies of grouse in Colorado declined dramatically in the late 1800's (Cooke 1897, Sclater 1912) and it persisted in only scattered localities by the 1960's (Bailey and Niedrach 1965). The Colorado Division of Wildlife periodically ascertained locations of active leks and conducted surveys of birds on leks in the 1960's continuing until the present (Unpubl. files, Denver and Fort Collins). During this period, Stearns (1968) identified general habitats associated with sharptails in east-central Colorado. With enactment of the Federal Endangered Species Act of 1973, the Colorado Division of Wildlife classified the plains sharp-tailed grouse as endangered in Colorado in 1976. This designation was followed by an inventory in Douglas and Elbert counties (Kahn 1979) that resulted in an estimate of 175-200 birds.

The next intensive work on plains sharptails in Colorado occurred in 1986 with a pilot effort to map the present distribution and status of the subspecies (Hoag and Braun 1990). This resulted in further work on habitat and home ranges of sharptails in Douglas County (Hoag 1989). Subsequent efforts have included transplants to Las Animas County, searches for active leks, counts of birds on active leks, leases of habitats to control livestock grazing, preparation of a management plan for a property bequeathed to the Colorado Division of Wildlife in an area with a population of sharptails, and identification of potential transplant sites.

The intent of Colorado's Nongame, Endangered, or Threatened Species Conservation Act (Title 33, Article 2, Colorado Revised Statutes) is to restore, perpetuate and, when possible, eventually delist all species/subspecies classified as threatened or endangered from that status. "Endangered species" means any species or subspecies of native wildlife whose prospects for survival or recruitment within Colorado are in jeopardy as determined by the Colorado Wildlife Commission. "Threatened species" means any species or subspecies of wildlife which, as determined by the Colorado Wildlife Commission, is not in immediate jeopardy of extinction but is vulnerable because it exists in such small numbers or is so extremely restricted throughout all or a significant portion of its range that it may become endangered (Title 33, Article 1, Colorado Revised Statutes). The objectives of the recovery plan for plains sharp-tailed grouse are to (1) summarize the available information about this subspecies and its habitat, and (2) present specific objectives and strategies to downlist and eventually delist the subspecies from its present endangered status in Colorado.

SUBSPECIES DESCRIPTION

Plains sharp-tailed grouse are brown and buff-colored chicken-like birds with short pointed tails. They are buff gray above barred with black, with brown wings mottled by black and white spots; the foreneck, breast, and sides are heavily mottled with dark V-marks with a pale underbelly. Both sexes have yellow eye combs and males have purple air sacs on both sides of the neck (Bailey and Niedrach 1965). Males weigh from 700 to 990 gms while females weigh from 625 to 900 gms (Sisson 1976, Swenson and Eng 1984). Carpal lengths average about 230 mm for males and 217 mm for females in Colorado (A. W. Hoag,

unpubl. data). Total body length ranges from 375 to 480 mm (Bailey and Niedrach 1965). Plains sharptails resemble greater prairie-chickens (T. cupido) with which they hybridize in Colorado (Evans 1966; M. A. Schroeder and others, unpubl. records).

DISTRIBUTION

Plains sharp-tailed grouse historically occurred from northern New Mexico through eastern Colorado and western Kansas, north-northwest into Nebraska, Wyoming, the Dakotas, and Montana into the prairie provinces of Canada (Aldrich and Duvall 1955, Aldrich 1963). The historical distribution of this subspecies along the southern boundary of its range is poorly known. Specimen records exist for Union County, New Mexico (Am. Mus. Nat. Hist. #'s 353690-353695 labeled as T. p. columbianus) and the range of the subspecies probably extended into northeast Colfax County (Ligon 1927, Bailey 1928, Hubbard 1970) and extreme western Oklahoma (Cimarron County) (Nice and Nice 1924, Sutton 1967). Historical locations in New Mexico and Oklahoma are immediately south of Las Animas and Baca counties, Colorado. Only one historical specimen record could be found for Kansas (Chicago Field Mus. Nat. Hist. #94464) and the closest specimen records in Wyoming are from Platte and Converse counties in the southeast part of the state (Am. Mus. Nat. Hist. #353697, Chicago Field Mus. Nat. Hist. Conover #11924). Presently, sharptails are known to breed near Midway and Albin, and have been observed southeast of Cheyenne in Laramie County (H. J. Harju, unpubl. records, 1990-91). This is immediately adjacent to Larimer and Weld counties, Colorado.

Within Colorado, plains sharp-tailed grouse historically occupied habitats east of the Front Range of the Rocky Mountains from Larimer County (Cooke 1897, Sclater 1912) south into El Paso County (Aiken and Warren 1914) and east to Kit Carson, Lincoln, and Yuma counties (Cooke 1897, Sclater 1912). Within this area, specimens from Arapahoe, Clear Creek, Douglas, Elbert, and Yuma counties are in the Denver Museum of Natural History (Bailey and Niedrach 1965), American Museum of Natural History, or National Museum of Natural History. This race of sharp-tailed grouse historically was most abundant along the foothills in Larimer (Cooke 1897, Sclater 1912), Boulder (Henderson 1909), Douglas (Bailey and Niedrach 1965), and El Paso counties (Aiken and Warren 1914). However, both Cooke (1897) and Sclater (1912) reported that sharp-tailed grouse were not common in Colorado. Apparently, the species' distribution and abundance declined dramatically between 1877 and 1887 (Cooke 1897). By 1962-65, plains sharptails were known to occur in only Douglas and Elbert counties, with possible stragglers in El Paso, Phillips, Sedgwick, Teller, and Yuma counties (Evans 1964, Stearns 1968, Rogers 1969). No specimen records exist for sharptails south of a line from El Paso to Kit Carson counties despite their reported historical occurrence in this area (Fig. 1).

This subspecies once occupied suitable habitats in at least 11 counties in northeastern Colorado. Presently, self-sustaining populations occur only in Douglas County, with confirmed sightings occasionally reported in Yuma, Weld, and Logan counties (Hoag and Braun 1990). More recently (1990-91) sharptails have been increasing in the area of the Tamarack Prairie near Crook owned by the Colorado Division of Wildlife. As many as 18 sharptails and hybrids (with greater prairie-

chickens) were identified on leks in this area in spring 1991 (L. R. Crooks and M. A. Schroeder, unpubl. records).

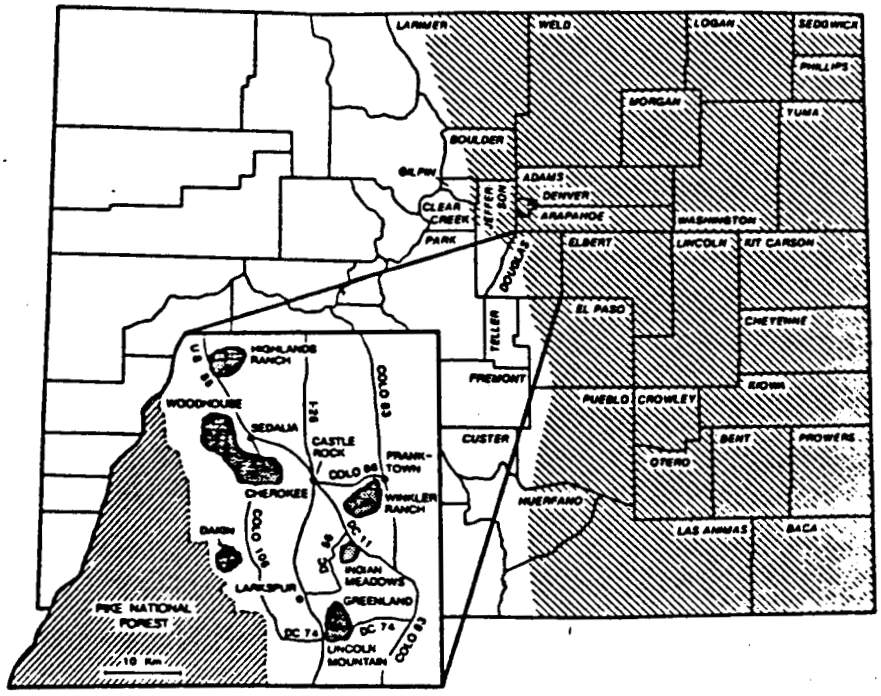

Fig. 1. Assumed historical (after Aldrich and Duvall 1955, Aldrich 1963) and present (inset) distribution of plains sharp-tailed grouse in Colorado.

LIFE HISTORY AND HABITAT REQUIREMENTS

Six subspecies (T. phasianellus campestris, T. p. caurus, T. p. columbianus, T. p. jamesi, T. p. kennicotti, T. p. phasianellus) of sharp-tailed grouse are recognized with the plains sharptail (T. p. jamesi) having the largest distribution (Aldrich 1963). Substantial literature exists on 4 subspecies (campestris, columbianus, jamesi, phasianellus) but efforts were made to restrict literature used in preparation of this report to T. p. jamesi, commonly referred to as plains sharp-tailed grouse. This race historically was a resident of midgrass prairies intermixed with shrub ecotones and draws with woody vegetation (Aldous 1943, Aldrich 1963). The available literature on plains sharp-tailed grouse has been summarized by Prose (1987).

Habitat Use.--Plains sharp-tailed grouse use different habitats seasonally with extensive use of grassland and grassland-low shrub transition zones throughout the year (Hillman and Jackson 1973, Sisson 1976, Moyles 1981, Swenson 1985). Upland areas associated with cropland are also used extensively during all seasons (Swenson 1985) but may be most important in fall and winter (Hillman and Jackson 1973, Swenson 1985). Riparian areas and hardwood/deciduous shrub draws are important for winter, especially during severe environmental conditions (Aldous 1943, Moyles 1981, Swenson 1985).

Habitats used by sharptails during the breeding period are those associated with leks and sites with good residual cover between leks and foraging areas (crop fields, wooded draws, shrub thickets). Leks occur in a variety of sites from mowed wet meadows (Kobriger 1965), low ridges and knolls (Rippin and Boag 1974, Sisson 1976) to recent burns (Sexton and Gillespie 1979). Distribution of leks may be influenced by the proximity of dense residual herbaceous cover (Brown 1966, Pepper 1972, Kirsch et al. 1973). However, plains sharptails appear to avoid areas with extensive woody vegetation during the breeding period (Moyles 1981).

Nesting sites used by plains sharptails generally are in grass with cover height (>30.5 cm tall) and foliar density being most important (Christenson 1970, Pepper 1972). Visual obstruction readings (height-density index) at nest sites generally average >1.5 dm (Kohn 1976, Kohn et al. 1982). While hens generally nest >50 m from woody cover, sharptail broods are typically associated with shrubs and brushy draws (Brown 1966, Bernhoft 1969, Pepper 1972, Hillman and Jackson 1973, Kohn 1976, Sisson 1976).

Moyles (1981) working in Alberta summarized his habitat use data by suggesting that a mosaic of plant communities, particularly grasslands and grassland-shrub mixtures with extensive ecotone, provided optimum habitat for sharptails. Optimum habitat in eastern Montana described by Swenson (1985) was a mosaic of upland grass with skunkbush sumac (Rhus trilobata) and riparian hardwood draws associated with small upland winter wheat fields. In western Nebraska, Sisson (1976) suggested that sharptail habitat use was a function of the physiognomy of landform and vegetation with grouse selecting lightly grazed or ungrazed sites for nesting and loafing.

Foods.--Plains sharp-tailed grouse use a variety of foods throughout the year ranging from diets high in insect material (chicks), cultivated cereal crops (corn, oats, wheat, barley, sorghum) to buds of deciduous shrubs and trees (Aldous 1943, Kobriger 1965, Hillman and Jackson 1973, Sisson 1976, Swenson 1985). Major native winter foods are primarily the fruits and buds of rose (Rosa spp.), willow (Salix spp.), chokecherry (Prunus spp.), cottonwood/aspen (Populus spp.), serviceberry (Amelanchier spp.), sumac (Rhus spp.), buffaloberry (Shepherdia spp.), hawthorn (Crataegus spp.), snowberry (Symphoricarpos spp.), juniper berries (Juniperus spp.), and Russian-olive (Elaeagnus angustifolia).

Movements.--Seasonal movements of sharptails can be extensive (>100 km) (Robel et al. 1972, Hillman and Jackson 1973). However most movements appear to be <5 km between seasons (Jackson 1967, Pepper 1972, Hillman and Jackson 1973, Sisson 1976, Kobriger 1980). Lek to nest distances generally are <3.2 km (Pepper 1972, Kobriger 1980). Sisson (1976) found that most movements of sharptails in Nebraska were within an area of <4.8 km diameter during a 12-

month period. Females, especially juveniles, had greater dispersal tendencies than males in a study in South Dakota (Robel et al. 1972).

Population Characteristics.--The composition of populations of plains sharp-tailed grouse is poorly known as most research has focused on breeding activities and habitat requirements. Substantial information on characteristics of the fall harvest is available in unpublished Federal Aid reports but these data may be biased by method of collection and inadequate analyses. Robel et al. (1972) and Hillman and Jackson (1973) working with the largest data set (7,285 individuals were banded in winter between 1963 through 1968) reported annual mortality rates of 70-71% (based on recaptures) or 70-79% (based on shot recoveries). They estimated that hunters harvested 20-25% of the birds on their study areas each year. Winter population estimates were 1.8 to 4.7 birds/km^2. Slightly more males (1.32:1) than females were trapped on one study area but fewer males (0.71:1) than females were trapped at the other study area. Juveniles were more common than adults in both harvest and trap samples. However, sex and age ratios of banded and unbanded birds harvested by hunters were similar.

FACTORS LEADING TO ENDANGERED STATUS

Plains sharp-tailed grouse were not abundant in Colorado after 1900 (Sclater 1912) and it has been speculated the distribution and abundance of this subspecies declined because of land cultivation (Aldrich 1963, Miller and Graul 1980), livestock grazing (Miller and Graul 1980), and fire control (Hoag and Braun 1990). Several studies have documented that livestock grazing can negatively impact habitats and population levels of plains sharp-tailed grouse (Yde 1977, Matisse 1978, Nielson 1978, Messmer 1985). It has also been documented that

range management favoring livestock has affected the abundance of native grasses, forbs, and shrubs upon which sharptails depend (Sisson 1976). Hoag and Braun (1990) cited urban development as a major cause of habitat loss in Douglas County, Colorado. There is little doubt that overgrazing by livestock is restricting the distribution and abundance of plains sharptails in Colorado at the present time.

The cumulative effect of conversion of native rangeland to cropland, domestic livestock grazing, suburban developments, and wild fire suppression has reduced the available habitat for plains sharp-tailed grouse in Colorado. A small population existed in Elbert County prior to 1986, but no birds were observed in surveys conducted in 1986, 1988, and 1990 (A. W. Hoag and C. E. Braun, M. R. Wertz, O. DeHerrera, unpubl. reports, Colo. Div. Wildl., Fort Collins). Rangeland in Elbert County has fewer shrubs than in Douglas County, but there are also fewer suburban developments. The key factor in the apparent disappearance of plains sharp-tailed grouse in Elbert County appears to be the lack of nesting and escape cover.

Key factors affecting plains sharp-tailed grouse in Douglas County appear to be loss of native rangeland to housing developments, invasion of conifers especially ponderosa pine (Pinus ponderosa) as a result of fire suppression, and overgrazing by domestic livestock (Hoag 1989). Development is currently proceeding or is in preliminary stages near 5 of the 8 documented sharp-tailed grouse leks.

We hypothesize that historical habitat for plains sharp-tailed grouse in eastern Colorado was restricted to shrub-prairie ecotones along the foothills of the Rocky Mountains and stream courses east of the mountains where shrubs occurred. These types were not abundant prior to settlement. This hypothesis is supported

by the reports of Cooke (1897) and Sclater (1912) which suggest that sharptails in eastern Colorado became rare in a short period coincident with agricultural development and livestock use of areas along stream courses.

We further hypothesize that, historically, plains sharp-tailed grouse in Colorado were restricted to relatively small, linear, isolated "pockets" of habitat. They were only able to persist in areas with relatively large expanses of shrubs especially Gambel's oak (Quercus gambelii) with lesser amounts of mountain mahogany (Cercocarpus montanus), fragrant sumac (Rhus aromatica), and western snowberry (Symphoricarpos albus) devoid of conifers (probably because of wild fires). The future of plains sharp-tailed grouse in Colorado depends upon maintaining open areas in Douglas County and/or other areas where habitats can be managed for sharptails or where sharptails can be successfully transplanted. Management should include changing domestic livestock grazing practices to increase residual herbaceous cover, controlled use of fire, and prevention of conifer invasion.

CURRENT STATUS

Prior to 1986 periodic efforts were made by personnel of the Colorado Division of Wildlife and volunteers to locate active leks and count birds present. These efforts were sporadic and usually only for 2-3 days each spring. During the 1986-88 interval and again in 1990, systematic surveys were made of all suitable appearing habitats in Douglas and Elbert counties. Roadside surveys were made from 0430 to 0900 hrs during March through May aided by use of a parabolic listening device, spotting scope, and binoculars. Surveys were taken along county roads and on private ranches with 3-5 minute stops every 0.8 km to listen and look for sharp-tailed grouse. Personnel of the Colorado Division of Wildlife and

knowledgeable observers were also asked to provide information on sharptails in historical use areas throughout eastern Colorado.

Landowners with known historical leks were contacted and interviewed to provide historical data and status of current populations on their land. Where necessary, field searches were conducted on foot to obtain coverage of ranches with apparently suitable habitat. Historical data were plotted on topographic maps to establish priority areas to be searched.

Plains sharp-tailed grouse were located only in Douglas County (Fig. 1) with 6 active leks documented. Two historical leks (Highlands Ranch, Winkler Ranch) were apparently inactive, although presumed male sharp-tailed grouse were observed in the vicinity. Fifty-two males ($\bar{x}$ = 9.6/lek) and 22 females ($\bar{x}$ = 4.4/lek) were observed on 5 active leks in 1986 while 27 males (9.0/lek) and 8 females (2.7/lek) were observed on 3 active leks in 1991.

If one-half of the males in an area were present during the time of hen attendance in April (Robel 1970, Rippin and Boag 1974) and the sex ratio was 1:1, the population of plains sharp-tailed grouse at the 5 active and 2 apparently inactive historical leks in Douglas County in 1986 was about 148 birds. This assumption may not be valid for small populations. However, it is also doubtful that all active leks were located. Thus, the minimum estimated size of the plains sharp-tailed grouse population in Douglas County during 1986-91 was at least 74 and possibly as high as 148 birds.

More recently (1990-91) small numbers of sharptails and hybrids with greater prairie-chickens have been observed near Crook (Tamarack Ranch). These immigrants from Nebraska appear to be increasing and may number 20-30 birds.

Table 1. Counts of plains sharp-tailed grouse, Douglas County, Colorado 1986-91.

	Males						Females					
Lek	1986	1987	1988	1989	1990	1991	1986	1987	1988	1989	1990	1991
Cherokee	10	11	7	10	4	4	7	2	4	2	2	0
Dakin	11	7	4	3	2	2	4	4	3	1	2	1
Woodhouse	15	NC[d]	NC	18	18	21	11	NC	NC	0	7	7
Greenland	4	[c]	[c]	NC	0[b]	0	0	0	0	NC	0	0
Indian Meadows	--	--	3	3	0	0	--	--	0	0	0	0
Lincoln Mountain	8	6	6	0	0	0	0	0	2	0	0	0
Highlands Ranch[a]	2	NC	NC	NC	0	--	0	NC	NC	NC	0	--
Winkler Ranch[a]	2	NC	NC	NC	0	--	0	NC	NC	NC	0	--

[a]Inactive although non-displaying birds thought to be males were observed in the area.

[b]Single birds flushed within 2-km radius on 3 different mornings.

[c]Related to Lincoln Mountain.

[d]NC = no count.

TRANSPLANTS

Transplants of plains sharp-tailed grouse with wild-trapped stock from Nebraska and North Dakota were made to Las Animas County east of Trinidad in 1987 (50 birds; 27 males, 23 females), 1988 (57 birds; 27 males, 30 females), and 1989 (48 birds; 33 males, 15 females). Twenty-two of the birds were fitted with radios and infrequently followed. Most movements were north of and within 8-15 km of the release site. While reports of sharptails near the release site have occurred, the status (1991) of this transplant is not clear as no leks have been found (R. B. Davies, unpubl. data).

Evaluation of one site, Rocky Flats-Boulder Open Space in Jefferson and Boulder counties, for a potential transplant has been completed and an Environmental

Assessment is being prepared by the U.S. Department of Energy. A potential release site on Fort Carson is presently being evaluated and preliminary mapping has been completed for a proposed release north of Livermore in Larimer County. In addition, plans are underway for an evaluation of a site on top of Raton Mesa in Las Animas County. Mapping of occupied habitats and management area designs have also been completed for 4 currently occupied areas (Cherokee, Dakin, Greenland, Woodhouse) in Douglas County. One of these sites (Greenland) may require a transplant as present populations are extremely low.

The objective of any transplant should be to develop a self-sustaining breeding population of 200 birds or 100 displaying males (Toepfer et al. 1990). These authors suggest that 30 km^2 (11.6 mi^2) of suitable habitat are necessary to maintain a stable self-sustaining breeding population of sharp-tailed grouse. Data collected in Colorado suggest that apparently stable populations may contain <100 grouse and occupy <30 km^2.

RECOVERY PLAN

Goal: To ensure the survival of plains sharp-tailed grouse as a resident breeding species in Colorado, both short- and long-term strategies will be used. Short-term strategies will be used within historic range along the Front Range where possibly 8 areas occur which presently support or could support sharptails. These areas are relatively small (<30 km^2) and may not be able to support plains sharp-tailed grouse in perpetuity without periodic transplants of additional birds. Long-term strategies will be used within historic range in eastern Colorado where possibly 4 areas occur which could support sharptails. These areas are relatively

large (>30 km^2) and have the potential to support sharptails in perpetuity without periodic transplants of additional birds.

1. Downlist from endangered to threatened status by 2008 when there are 4 (2 short-term areas and 2 long-term areas) discrete occupied areas of at least 10 mi^2 (25.9 km^2) each of which supports an estimated minimum breeding population of 100 (50 displaying males) plains sharp-tailed grouse for 3 consecutive years. These criteria follow Toepher et al. (1990) and current data from Douglas County on minimum required area. Size of "discrete areas" is subject to re-evaluation as new data becomes available. A discrete area is one that is geographically continuous but at least 20 miles (32.2 km) (further than most casual movements but close enough to allow gene flow) from the closest other occupied area (following Verner 1992). Areas closer than 20 miles (32.2 km) separated by major geographic - topographic barriers that support viable populations of at least 100 birds will be considered as discrete populations if those populations are stable for at least 3 years. Two of the 4 discrete occupied areas (1 each short-term and long-term) will be under management control of the Colorado Division of Wildlife (CDOW) and 2 will be under management agreements with other private/public entities to benefit sharptails.
2. Delist from threatened status to subspecies of special concern by 2023 if there are 6 discrete occupied areas (3 each short-

term and long-term) of at least 10 mi^2 (25.9 km^2) each of which supports an estimated minimum breeding population of 100 plains sharp-tailed grouse for 3 consecutive years. At least 3 discrete occupied areas will be under management control of the Colorado Division of Wildlife while agreements benefitting sharptails will be obtained with other private/public entities for at least 3 other areas.

Data collected through intensive management and research efforts starting in 1986 indicate that plains sharp-tailed grouse abundance and distribution is decreasing with only 3 of 6 leks active in 1986-88 also active in 1991. Further, only 3 leks appear to have breeding populations of sharptails associated with them. None of these leks is on property managed by the Colorado Division of Wildlife. However, one lek is immediately adjacent to a property now owned and managed by the Colorado Division of Wildlife for sharptails. Also, sharptails appear to be increasing in the Tamarack Ranch area near Crook.

One transplant (Las Animas County) has been completed (1987-89) but the status of this effort is presently unclear. There are no indications of immediate success. Further effort is needed to identify the status of this transplant. An experimental transplant into historical range is recommended for spring 1992 and 1993 into an area that will not be developed in the near future (Rocky Flats - Boulder Open Space or Fort Carson). The Rocky Flats site has been ungrazed by domestic livestock for at least 30 years while domestic livestock grazing on Boulder Open Space is being managed to improve range condition and trend. No grazing is allowed on the Fort Carson Military Reservation.

The major threat to plains sharp-tailed grouse is habitat alteration associated with human activity and disturbance. It is important to recognize that potential habitat for this grouse in Colorado is finite. Plains sharp-tailed grouse do not currently occupy all habitat available because of the isolated nature of the present populations. To ensure the future survival of plains sharp-tailed grouse, management recommendations and incentives need to be developed to encourage landowners to manage private property to benefit this subspecies. Potential suitable habitat must be identified and managed for continuing transplant efforts. The condition of populations and habitats must be periodically monitored to maintain an appropriate balance. The public must be made aware of the status of this unique bird and understand its aesthetic and ecological value.

Step-down Plan

1. Manage and acquire habitat.

    1.1 Maintain favorable habitats and improve those which are in less desirable condition. Management must be flexible to adjust to changing climatic, technological, and social conditions.

        1.11 Develop cooperative agreements with public and private entities to manage habitats for plains sharptails within identified transplant or currently occupied areas (Regions).

            1.111 Develop cooperative agreement to maintain sharptail habitat in transplant areas with the U.S. Department of Energy (for Rocky Flats).

            1.112 Develop cooperative agreement to manage and improve habitats for sharptails with the City of Boulder Open Space.

1.113 Develop cooperative agreement to manage and improve habitat for sharptails with Boulder County Open Space.

1.114 Develop cooperative agreement to maintain sharptail habitat in transplant areas with the U.S. Department of Defense (Fort Carson).

1.115 Develop cooperative agreement to manage and improve habitats for sharptails with the State Board of Land Commissioners.

1.116 Develop cooperative agreement to lease and manage areas for plains sharp-tailed grouse with The Nature Conservancy.

1.117 Work with county zoning agencies to protect habitats for plains sharp-tailed grouse.

1.12 Develop grazing recommendations that can be used by landowners on private land to benefit plains sharp-tailed grouse. Develop grazing prescriptions specific to sharptails that can be used to influence land management decisions and that will be valid in the legal system relating to conservation easements and other land management recommendations (Research).

1.13 Prepare habitat improvement/development guidelines in the Cooperative Habitat Improvement Program (CHIP) to make it economically feasible for private landowners to improve their property to benefit plains sharp-tailed grouse (CHIP Coordinator).

1.131 Develop a brochure for private landowners with management recommendations for improving rangeland for plains sharp-tailed grouse and explaining the CHIP program relating to sharptails.

1.14 Work with the Soil Conservation Service (SCS) and land management agencies to develop joint management recommendations for sharptails and to monitor existing management practices (Regions).

1.141 Work with SCS to incorporate grazing recommendations (when available) to benefit plains sharp-tailed grouse in Great Plains contracts and conservation plans.

1.142 Work with SCS and Agricultural Stabilization and Conservation Service (ASCS) to monitor shrub control projects within occupied range. Make necessary NEPA comments. Current recommendations include restricting sprayed areas to no more than 130 ha (320 ac) within a 260-ha (640 ac) area in any one year.

1.143 Work with personnel of Rocky Flats to develop management prescriptions to maintain and enhance the suitability of federal lands for plains sharp-tailed grouse.

1.144 Work with personnel of City and County of Boulder Open Space departments, and other municipal and county governments to enhance the suitability of lands under their management jurisdiction for plains sharptails.

1.145 Work with personnel of The Nature Conservancy to assist in developing lands under their management control for plains sharptails.

1.146 Work with personnel of the State Board of Land Commissioners to enhance state lands for plains sharptails.

1.147 Work with personnel of the U.S. Department of Defense to develop management prescriptions to maintain and enhance suitability of lands on Fort Carson for plains sharp-tailed grouse.

1.148 Work with Animal and Plant Health Inspection Service (APHIS), ASCS, and individual counties to update county Environmental Assessments (EAs) relating to grasshopper control. Assist APHIS to monitor use of pesticides within the range of the plains sharp-tailed grouse.

1.15 Apply habitat management techniques to be developed on the Woodhouse State Wildlife Area including prescribed burning, reseeding, mowing of artificial leks, and water development to private lands, other state owned properties, and newly acquired habitats (Regions).

1.2 Acquire habitat for plains sharp-tailed grouse including long-term leases (25-30 years minimum) or perpetual conservation easements on private land. Work with other land management agencies or private organizations to gain management control of suitable habitat.

1.21 Gain limited surface control of at least 2 areas each with at least 1,215 ha (3,000 ac) (believed to be the minimum area necessary to maintain a population of 100 sharptails) of contiguous rangelands within the occupied range of the plains sharp-tailed grouse through a state initiated conservation easement or through a private organization such as The Nature Conservancy or The Trust for Public Land (Regions).

1.211 Potential areas for consideration include lands adjacent to the present Woodhouse State Wildlife Area, an area near Dakin Road in Douglas County, areas near Greenland, and near Crook. Acquisition of these properties would provide for preservation of some of the better actual/potential areas of plains sharp-tailed grouse habitat in Colorado. Limited surface control would allow for habitat management including grazing restrictions, management of conifer invasion, and access for increasing demands to view sharptails during the spring.

1.22 Acquire limited surface control of at least 2 areas each with at least 1,215 ha (3,000 ac) of rangeland within currently unoccupied but historical range of plains sharp-tailed grouse through a state initiated conservation easement or through a private organization such as The Nature Conservancy or The Trust for Public Land (Regions).

1.221 Potential areas for acquisition include lands near Barnesville, north of Livermore, along the Arikaree River, the Raton Mesa - Mesa de Maya area east of Trinidad, an area near Running Creek in Elbert County, and Green Mountain in Jefferson County. Acquisition of these properties would allow for re-introduction of plains sharp-tailed grouse into historical range. Limited surface control would primarily include grazing restrictions and development of small food plots and shrubs in areas where winter and spring food is limiting.

1.23 Lease habitats near or including active leks and in historical use areas where transplants are planned to reduce livestock grazing to insure adequate vegetative cover for escape, nesting, etc. (Regions).

1.24 Evaluate all Farmers Home Administration (FmHA) Inventory and Resolution Trust Corporation (RTC) lands within currently occupied sharptail range and areas of potential range for establishment of conservation easements and/or deed restrictions to benefit plains sharp-tailed grouse. All FmHA Inventory and RTC lands considered for acquisition or easements will be evaluated and follow Federal statutory guidelines and procedures established by the Colorado Wildlife Commission for Real Estate Commission Action Items (Regions).

2. Monitor plains sharp-tailed grouse populations.

2.1 Continue annual inventories.

2.11 Continue inventory of active and historical lek sites in Douglas and Elbert counties on a standardized basis each year using a temporary employee, volunteers, or District Wildlife Managers (Central Region).

2.111 Refine census methodology. Standardize and distribute forms for reporting and summarizing data (Research).

2.12 Conduct intensive inventory efforts of the Las Animas County transplant area in spring 1992 and 1993 (Southeast Region).

2.13 Continue inventory of areas near Tamarack Ranch to monitor expansion of plains sharp-tailed grouse immigrants in areas with greater prairie-chickens (Northeast Region and Research).

2.14 Provide training in inventory methodology and reporting to cooperating land management agencies (Research).

3. Conduct transplants.

3.1 Develop pre-release procedures. Establish guidelines for identifying suitable habitat (Research). A primary consideration includes identification of suitable habitat for release and monitoring the area to learn if prairie grouse are present. In addition, if releases are to be made on private property, an agreement between the landowner(s) and the Colorado Division of Wildlife must be obtained to provide for protection of the birds and their habitat, and to allow access for monitoring (Regions).

3.11 If a conservation easement is obtained, habitat modification prior to release may be necessary and may include reducing grazing and

establishing small (2 - 6 ha [5 - 15 ac]) food plots when small grain crops are not available within a 10-km (6.25 mi) radius from the release site (Regions). It is also important, however, that cropland in the area not exceed 40% of the surrounding grasslands.

3.2 Develop transplant methodology suitable for plains sharp-tailed grouse and Colorado (Research). Initial transplants should be from stable populations in late winter or spring, primarily from similar areas in eastern Wyoming or western Nebraska. Transplant populations should be 50% females and 50% males each year. All birds should be released at the same location during the first year. A minimum of 40 birds per year should be transplanted over a 2-year period to ensure adequate release of birds to establish a self-sustaining population. A sample (10% minimum) of birds transplanted into Colorado should have blood tests for Mycoplasma spp. prior to release to ensure release of healthy birds. If birds from the sample test positive for Mycoplasma gallisepticum all birds will be tested. Birds testing positive for Mycoplasma gallisepticum will not be transplanted.

3.3 Transplant plains sharp-tailed grouse into areas within potential range that appear (size, habitat quality) to be able to support a self-sustaining population.

3.31 Transplant sharptails to 2 selected areas. Potential areas for transplants include Rocky Flats-Boulder Open Space, Rocky Mountain Arsenal, Barnesville to Riverside Reservoir, the northern portion of Fort Carson, the area north of Livermore, Raton Mesa and Mesa de Maya east of Trinidad, near Running Creek in Elbert

County, Green Mountain in Jefferson County, and in the Greenland area (Regions and Research).

3.4 Develop and implement post-release procedures.

3.41 Research will work cooperatively with Regions to monitor populations during transplants including blood testing, banding, and radio-tracking.

3.42 Each Region will take the lead for trapping, inventory, and any habitat modification necessary within that Region.

4. Identify needed management practices through research.

4.1 Conduct research on plains sharp-tailed grouse biology. Understanding the ecology of plains sharp-tailed grouse in Colorado is essential for their management. Unfortunately, many of the basic questions regarding sharp-tailed grouse biology remain unanswered. With greater demands on what remains of sharp-tailed grouse habitat, research will be an integral part of the species recovery.

4.11 Investigate how grazing practices affect sharp-tailed grouse habitat and develop recommendations that are economically acceptable to private landowners yet benefit sharptails. Plains sharp-tailed grouse in Colorado occur almost exclusively on private property where economics govern grazing practices and habitat condition.

4.12 Evaluate the minimum size of an area needed to support a stable population of sharptails.

4.13 Continue efforts to develop the most effective transplant methods. Implement and test updated methodology in future transplants.

4.14 Continue efforts to develop and test optimum habitat manipulation methods. Implement these methods on newly acquired properties.

4.15 Continue efforts to evaluate Mycoplasma gallisepticum in Colorado's plains sharp-tailed grouse populations and significance to management.

4.151 Formulate regulations to address disease issues and releases of commercially-raised wildlife as they relate to plains sharp-tailed grouse.

5. Implement public education and watchable wildlife programs (Regions and Public Services).

5.1 Increase landowner education because plains sharp-tailed grouse occur almost entirely on private property.

5.11 Make landowners aware of the need to preserve the remaining habitat of plains sharp-tailed grouse. Advise interested landowners of the bird's habitat requirements and the need to reintroduce the bird into its former range.

5.12 Use the Woodhouse State Wildlife Area as a model for testing habitat manipulation practices benefiting plains sharp-tailed grouse.

5.13 Publish brochures giving life history information, habitat requirements, and management practices that benefit sharptails.

5.14 Develop a video presentation on plains sharp-tailed grouse emphasizing the importance of beneficial land management practices.

5.15 Encourage representatives of the SCS and land management agencies to examine the Woodhouse State Wildlife Area to learn appropriate management practices to benefit sharptails for incorporation in conservation plans and Great Plains contract development work.

5.2 Demand for programs and field trips to observe plains sharp-tailed grouse is high. This provides an excellent opportunity to generate support for recovery and inform people about the life history, management, and aesthetic value of this unique bird.

5.21 Continue to make organized programs and tours which are offered each spring a high priority for management. It may be possible to use volunteers from the Watchable Wildlife program and other conservation organizations to assist with tours.

5.22 Develop and distribute brochures to people unable to go on an organized tour that describe life history and etiquette for viewing birds with minimum impact. It should be stressed that individuals need permission to enter private property to view sharptails and that access is limited.

5.23 Work with local communities to realize the value of the plains sharp-tailed grouse from a tourism aspect.

5.24 Develop public viewing areas for plains sharp-tailed grouse.

5.241 Conduct limited guided tours to selected leks that have been active (>6 males/year) for at least 2 consecutive years.

5.242 Develop self guided public viewing tours for selected leks that have been active (>6 males/year) for at least 3 consecutive years.

5.243 Work with cooperating land management agencies where appropriate to develop viewing opportunities near active leks.

6. Encourage local governments to protect plains sharp-tailed grouse habitat (Regions).

6.1 Provide local government with current maps of plains sharp-tailed grouse distribution.

6.2 Continue to provide expert comments on land development proposals which may affect plains sharp-tailed grouse.

PLAINS SHARP-TAILED GROUSE
CDOW BUDGET PRIORITY, SCHEDULE, AND COSTS[a]

No. (rank)	Activity	FY 91-92 (Actual)	Planning Year FY 92-93	FY 93-94	FY 94-95	FY 95-96	Year 5-15
1.11 (1)	Develop coop. agreements	Continuous					
1.12 (8)	Develop grazing prescriptions for use on private land.		$1,000	$1,000	$3,000	$3,000	$105,000
1.13 (9)	Incorporate CHIP into sharptail management		$1,000	$1,000	$1,000	$1,000	$10,000
1.131 (10)	Develop brochure explaining CHIP as it relates to sharptail management		$2,000				$3,000
1.14 (6)	Work with SCS and other agencies to develop recommendations and to assist with monitoring	Continuous					
1.15 (5)	Apply habitat management techniques to Woodhouse and other SWA's	$2,975	$2,500	$3,500	$3,500	$3,500	$35,000
1.21 (3)	Acquire 2 areas each of 1215 ha in occupied range for plains sharptailed grouse		$500,000	$500,000			
1.22 (4)	Acquire 2 areas each of 1215 ha in a transplant target area in historical range				$500,000	$500,000	
1.23 (2)	Lease habitats	$3,000	$3,000	$5,000	$5,000	$5,000	$50,000
1.24 (7)	Evaluate FmHA and RTC inventory lands for easements or deed restrictions	Continuous					
2.11 (1)	Inventory leks in occupied range annually	$2,860	$2,500	$5,000	$5,000	$5,000	$30,000
2.111 (4)	Refine inventory methodology	Continuous	$5,000	$5,000			
2.12 (2)	Conduct intensive inventory efforts in Las Animas County	$3,000	$3,000				
2.13 (3)	Inventory areas near Tamarack	$1,500	$1,500	$1,500	$1,500	$1,500	$20,000
3.1 (1)	Develop pre-release procedures	Continuous	$5,000	$5,000	$5,000	$5,000	$10,000

CDOW BUDGET PRIORITY, SCHEDULE, AND COSTS[a] (cont.)

No. (rank)	Activity	FY 91-92 (Actual)	Planning Year FY 92-93	FY 93-94	FY 94-95	FY 95-96	Year 5-15
3.2 (2)	Develop transplant methodology	$5,000	$5,000	$5,000	$5,000	$5,000	
3.3 (4)	Transplant sharptails to selected areas	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000
3.4 (3)	Develop post-release procedures including monitoring considerations	Continuous	$10,000	$10,000	$10,000	$10,000	$40,000
4.11 (3)	Conduct research on how grazing practices affect plains sharp-tailed grouse						$100,000
4.12 (1)	Evaluate minimum area needed to support sharptails	$10,000	$10,000	$10,000	$10,000		
4.13 (4)	Evaluate transplant methodology	Continuous					
4.14 (2)	Evaluate habitat manipulation	$5,000	$10,000	$10,000	$10,000		
4.15 (5)	Evaluate the extent and effects of Mycoplasma	Continuous					
5.11 (2)	Make landowners aware of sharp-tailed grouse habitat requirements	Continuous					
5.12 (5)	Use the Woodhouse SWA as a model for habitat mgmt	Continuous					
5.13 (7)	Publish brochures		$1,000		$1,000		$2,000
5.14 (8)	Develop video		$3,000				
5.21 (1)	Conduct programs & field trips in occupied range	Continuous					
5.22 (4)	Develop brochure on life history information and viewing etiquette			$500		$500	$2,500
5.23 (3)	Work with local communities to realize the value of the sharptail from a tourism aspect	Continuous					
5.24 (6)	Develop public viewing areas			$500	$1,000		$5,000
6.1 (1)	Provide maps of sharptail distribution	Continuous					
6.2 (2)	Provide expertise on land development proposals	Continuous					

[a]Does not include permanent FTE's and salaries.

LITERATURE CITED

Aiken, L. E. H., and E. R. Warren. 1914. The birds of El Paso County, Colorado. Colorado Coll. Sci. Series 12:455-603.

Aldous, S. E. 1943. Sharp-tailed grouse in the sand dune country of north-central North Dakota. J. Wildl. Manage. 7:23-31.

Aldrich, J. W. 1963. Geographic orientation of American Tetraonidae. J. Wildl. Manage. 27:529-545.

___, and A. J. Duvall. 1955. Distribution of American gallinaceous game birds. U.S. Dep. Inter., Fish and Wildl. Serv. Circ. 34. 30pp.

Bailey, A. M., and R. J. Niedrach. 1965. Birds of Colorado, Vol. 1. Denver Mus. Nat. Hist., Denver, CO. 454pp.

Bailey, F. M. 1928. Birds of New Mexico. New Mexico Dep. Game and Fish. Santa Fe. 807pp.

Bernhoft, L. S. 1969. Reproductive ecology of female sharp-tailed grouse (Pedioecetes phasianellus jamesi) and food habits of broods in southwestern North Dakota. M.S. Thesis. Univ. North Dakota, Grand Forks. 96pp.

Brown, R. L. 1966. Response of sharptail breeding populations to annual changes in residual grassland cover. Proc. Western Assoc. State Game and Fish Comm. 46:219-227.

Christenson, C. D. 1970. Nesting and brooding characteristics of sharp-tailed grouse (Pedioecetes phasianellus jamesi Lincoln) in southwestern North Dakota. M.S. Thesis. Univ. North Dakota, Grand Forks. 88pp.

Cooke, W. W. 1897. The birds of Colorado. Colo. Agric. Coll. Bull. 37. 144pp.

Evans, K. E. 1964. Habitat evaluation of the greater prairie chicken in Colorado. M.S. Thesis. Colorado State University, Fort Collins. 98pp.

___. 1966. Observations on a hybrid between the sharp-tailed grouse and the greater prairie chicken. Auk 83:128-129.

Henderson, J. 1909. An annotated list of birds of Boulder County, Colorado. Univ. Colorado Stud. 6:219-242.

Hillman, C. N., and W. W. Jackson. 1973. The sharp-tailed grouse in South Dakota. South Dakota Dep. Game, Fish and Parks Tech. Bull. 3. 64pp.

Hoag, A. W. 1989. Plains sharp-tailed grouse status and habitat use in Douglas County, Colorado. M.S. Thesis. Colorado State Univ., Fort Collins. 45pp.

___, and C. E. Braun. 1990. Status and distribution of plains sharp-tailed grouse in Colorado. Prairie Nat. 22:97-102.

Hubbard, J. P. 1970. Check-list of the birds of New Mexico. New Mexico Ornithol. Soc. Publ. 3. 103pp.

Jackson, W. W. 1967. Seasonal movements of prairie grouse in South Dakota. M.S. Thesis. South Dakota State Univ., Brookings. 47pp.

Kahn, R. H. 1979. Prairie sharp-tailed grouse segment. Unpubl. Rep., Colorado Div. Wildlife, Denver. 11pp.

Kirsch, L. M., A. T. Klett, and H. W. Miller. 1973. Land use and prairie grouse population relationships in North Dakota. J. Wildl. Manage. 37:449-453.

Kobriger, G. D. 1965. Status, movements, habitats, and foods of prairie grouse on a sandhills refuge. J. Wildl. Manage. 29:788-800.

___. 1980. Habitat use by nesting and brooding sharp-tailed grouse in southwestern North Dakota. North Dakota Outdoors 43(1):2-6.

Kohn, S. C. 1976. Sharp-tailed grouse nesting and brooding habitat in southwestern North Dakota. M.S. Thesis. South Dakota State Univ., Brookings. 123pp.

___, R. L. Linder, and G. D. Kobriger. 1982. Sharp-tailed grouse nesting habitat in southwestern North Dakota. Pages 166-174 in J. M. Peek and P. D. Dalke, eds., Proc. Wildlife-Livestock Relationships Symp. Univ. Idaho, For., Wildl. and Range Exp. Stn., Moscow.

Ligon, J. S. 1927. Wildlife of New Mexico: its conservation and management. New Mexico Dep. Game and Fish, Santa Fe. 212pp.

Miller, G. C., and W. D. Graul. 1980. Status of sharp-tailed grouse in North America. Pages 18-28 in P. A. Vohs, Jr. and F. L. Knopf, eds. Proc. Prairie Grouse Symp. Oklahoma State Univ., Stillwater.

Moyles, D. L. J. 1981. Seasonal and daily use of plant communities by sharp-tailed grouse (Pedioecetes phasianellus) in the parklands of Alberta. Can. Field-Nat. 95:287-291.

Mattise, S. N. 1978. Effects of grazing systems on sharp-tailed grouse habitat. M.S. Thesis. South Dakota State Univ., Brookings. 46pp.

Messmer, T. A. 1985. Effects of specialized grazing systems on upland nesting birds in southcentral North Dakota. M.S. Thesis. North Dakota State Univ., Fargo. 99pp.

Nice, M. M., and L. B. Nice. 1924. The birds of Oklahoma. Univ. Oklahoma Bull. New Series 20, Univ. Studies 286. 122pp.

Nielsen, L. S. 1978. The effects of rest-rotation grazing on the distribution of sharp-tailed grouse. M.S. Thesis. Montana State Univ., Bozeman. 52pp.

Pepper, G. W. 1972. The ecology of sharp-tailed grouse during spring and summer in the aspen parklands of Saskatchewan. Saskatchewan Dep. Nat. Resour. Wildl. Rep. 1. 56pp.

Prose, B. L. 1987. Habitat suitability index models: plains sharp-tailed grouse. U.S. Dep. Inter., Fish and Wildl. Serv. Biol. Rep. 82 (10.142). 31pp.

Rippin, A. B., and D. A. Boag. 1974. Recruitment to populations of male sharp-tailed grouse. J. Wildl. Manage. 38:616-621.

Robel, R. J. 1970. Possible role of behavior in regulating greater prairie chicken populations. J. Wildl. Manage. 34:306-312.

___, F. R. Henderson, and W. Jackson. 1972. Some sharp-tailed grouse population statistics from South Dakota. J. Wildl. Manage.36:87-98.

Rogers, G. E. 1969. The sharp-tailed grouse in Colorado. Colorado Div. Game, Fish and Parks Tech. Publ. 23. 94pp.

Sclater, W. H. 1912. A history of the birds of Colorado. Witherby and Co., London, U.K. 576pp.

Sexton, D. A., and M. M. Gillespie. 1979. Effects of fire on the location of a sharp-tailed grouse arena. Can. Field-Nat. 93:74-76.

Sisson, L. 1976. The sharp-tailed grouse in Nebraska: a research study. Nebraska Game and Parks Comm., Lincoln. 88pp.

Stearns, F. D. 1968. Sharp-tailed grouse density in east-central Colorado related to selected habitat factors. M.S. Thesis. Colorado State University, Fort Collins. 133pp.

Sutton, G. M. 1967. Oklahoma birds: their ecology and distribution, with comments on the avifauna of the southern Great Plains. Univ. Oklahoma Press, Norman. 674pp.

Swenson, J. E. 1985. Seasonal habitat use by sharp-tailed grouse, Tympanuchus phasianellus, on mixed-grass prairie in Montana. Can. Field-Nat. 99:40-46.

___, and R. L. Eng. 1984. Autumn weights of plains sharp-tailed grouse in Montana. Prairie Nat. 16:49-54.

Toepfer, J. E., R. L. Eng, and R. K. Anderson. 1990. Translocating prairie grouse: what have we learned? Trans. No. Am. Wildl. and Nat. Resour. Conf. 55:569-579.

Verner, J. 1992. Data needs for avian conservation biology: have we avoided critical research? Condor 94:301-303.

Yde, C. A. 1977. Effects of rest-rotation grazing on the abundance and distribution of sharp-tailed grouse. M.S. Thesis. Montana State Univ., Bozeman. 70pp.

APPENDIX

List of Draft Reviewers

Letter Requesting Comments and

Comments Received

Divisional Correspondence Only

STATE OF COLORADO

DIVISION OF WILDLIFE

DEPARTMENT OF NATURAL RESOURCES

DATE: 25 November 1991

TO: State Wildlife Managers and Interested Personnel

FROM: Plains Sharp-tailed Grouse Recovery Team

SUBJECT: Draft Plains Sharp-tailed Grouse Recovery Plan

Enclosed is a copy of the "draft" recovery plan for plains sharp-tailed grouse. I ask that you have your appropriate staff review this draft and furnish this office any pertinent comments or suggestions you may have on this document. Our concern is that the plan is a complete document capable of logically guiding present and future actions toward the recovery of the Colorado listed endangered plains sharp-tailed grouse.

Once we have received comments, they will be evaluated by the recovery team and appropriate staff. Should changes in the existing draft be necessary, they will be completed and the plan will be finalized for approval and implementation.

We would appreciate your comments by 6 January 1992. Thank you for your interest and participation.

CEB:dh
Enclosure

xc: R. Desilet
W. Graul
J. Torres
P. Goodman
L. Carpenter
C. Loeffler
J. Aragon
D. Prenzlow
D. Weber
L. Budde
G. Schoonveld
K. Giesen
G. Berlin
A. Duvall

CDOW REVIEWERS

Jim Aragon
Trinidad

Gary Berlin
Denver

John Bredehoft
Fort Collins

Larry Budde
Brush

Ruth Carlson
Colorado Springs

Len Carpenter
Denver

Dave Clippinger
Colorado Springs

Larry Crooks
Julesburg

Tim Davis
Sterling

Ron Desilet
Colorado Springs

Andre Duvall
Fort Collins

Ken Giesen
Fort Collins

Patsy Goodman
Denver

Walt Graul
Fort Collins

Tom Howard
Denver

Jim Jackson
Fort Collins

Rick Kahn
Denver

Chuck Loefler
Colorado Springs

Tom Lytle
Denver

Dan Prenzlow
Castle Rock/Craig

Franci Pusateri
Fort Collins

Tom Remington
Fort Collins

Gene Schoonveld
Fort Collins

Mike Schroeder
Fort Collins

John Torres
Denver

Ron Velarde
Pueblo

Dave Weber
Denver

Susan Werner
Evergreen

ADDITIONAL REVIEWERS

Agricultural Stabilization &
Conservation Service
2490 West 26th Avenue
Denver, CO 80211

Aiken Audubon Society
Attn: Ben Sorenson
P.O. Box 7617
Colorado Springs, CO 80933

Boulder County Open Space
c/o Nina Williams
3893 North 75th
P.O. Box 471
Boulder, CO 80306

Bureau of Land Management
Lee Upham
2850 Youngfield
Lakewood, CO 80215

City of Boulder Open Space
c/o Tamara Nauman
Real Estate/Open Space Dept.
P.O. Box 791
Boulder, CO 80306

Colorado Audubon Council
c/o Ed McConkey
3590 Berkley
Boulder, CO 80303

Colorado Bird Observatory
c/o Mike Carter
13401 Piccadilly Road
Brighton, CO 80601

Colorado Cattlemans Association
c/o Bob Roston,
Exec. Vice-President
Livestock Exchange Bldg.
Room 220
4701 Marion Street
Denver, CO 80216

Colorado Farm Bureau
Dean Kittel
Admin. Officer
2211 West 27th Avenue
P.O. Box 5647 TA
Denver, CO 80217

Colorado Field Ornithologists
c/o Hugh Kingery
869 Milwaukee
Denver, CO 80206

Colorado Oil & Gas
Conservation Commission
1580 Logan
Denver, CO 80210

Colorado State University
Maxwell Ranch
c/o Dr. Gary Greathouse
3324 Red Mountain Road
Livermore, CO 80536

Colorado Wildlife Federation
7475 Dakin Street
Suite 137
Denver, CO 80201-6915

Denver Audubon
3000 South Clayton #207
Denver, CO 80210

Denver Museum of Natural
History
c/o Charles R. Preston
Dept. of Zoology
2001 Colorado Blvd.
Denver, CO 80205

Douglas County Planning
Office
118 3rd Street
Castle Rock, CO 80104

Page deleted contained personally identifiable information

STATE OF COLORADO
Roy Romer, Governor
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE

AN EQUAL OPPORTUNITY EMPLOYER

Perry D. Olson, Director
6060 Broadway
Denver, Colorado 80216
Telephone: (303) 297-1192

Wildlife Research Center
317 West Prospect
Fort Collins, CO 80526

REFER TO

For Wildlife–
For People

25 November 1991

Dear

Enclosed is a copy of the "draft" recovery plan for plains sharp-tailed grouse. I ask that you have your appropriate staff review this draft and furnish this office any pertinent comments or suggestions you may have on this document. Our concern is that the plan is a complete document capable of logically guiding present and future actions toward the recovery of the Colorado listed endangered plains sharp-tailed grouse.

Once we have received comments, they will be evaluated by the recovery team and appropriate staff. Should changes in the existing draft be necessary, they will be completed and the plan will be finalized for approval and implementation.

We would appreciate your comments by 6 January 1992. Thank you for your interest and participation.

Sincerely,

Clait E. Braun
Recovery Team Leader

CEB:dh
Enclosure

AIKEN AUDUBON SOCIETY

COLORADO SPRINGS, COLORADO

January 29 1992

State of Colorado
Division of Wildlife
ATT Ms. Katherine A. Green
Wildlife Biologist, Central Region
6060 Broadway
Denver CO 80216

RE: Plains Sharptailed Recovery Plan

Dear Ms. Green:

We support your plan for the recovery of the Sharp-tailed Grouse.

The Aiken Audubon Society has an ongoing interest in all bird and bird habitat issues in the Pikes Peak Region. In particular we noted the potential introduction site at Fort Carson. We might note the Air Force Academy site as an additional potential site.

We could also support an effort with volunteers as observers and field observers.

Best of luck with your worthy project.

Yours truly,

P. Gary Conover

Gary Conover, President
Aiken Audubon Society

City of Boulder

Open Space/Real Estate Department
Post Office Box 791 Boulder, CO 80306
(303) 441-3440

January 6, 1992

Clait E. Braun
Wildlife Research Center
317 West Prospect
Fort Collins, CO 80526

Dear Clait:

Thank you for the opportunity to review the draft recovery plan for plains sharp-tailed grouse I writing to provide you with the comments of the City of Boulder Open/Real Estate Space Department (the Department).

The Department supports the reintroduction of plains sharp-tailed grouse into their historic range, and the recovery plan in general. We have the following specific recommendations to amend the text of the recovery plan:

- ✓ **Page 7, *Rhus trilohata* should be *Rhus trilobata***

- ✓ **Page 21, insert between §2.111 and §2.112 something to the effect of:** "Provide training in census methodology and reporting procedures to cooperating land management agencies."

- ✓ **Page 26, insert §5.243; some text to the effect of:** "Where appropriate, work with cooperating land management agencies to develop viewing opportunities near active leks."

The recovery plan does an excellent job of documenting the historic factors which have probably resulted in the extirpation of plains sharp-tail grouse from Colorado. However, the invasion of weeds is a more recent phenomenon which will certainly have implications for the recovery of the grouse.

A significant infestation of diffuse knapweed (*Centaurea diffusa* Lam.) is present in the southern portion of the City Open Space system. According to a local private weed control specialist the infestation extends onto adjacent lands controlled by the Department of Defense (Rocky Flats) and Western Aggregates, Inc. This infestation probably threatens the grouse reintroduction project in two ways. First, diffuse knapweed is included on the state noxious weed list, and therefore must be controlled. Second, if left unchecked, the knapweed will probably destroy much of the plains sharp-tail grouse habitat in the area.

Diffuse knapweed is non-native, and produces chemicals capable of suppressing the native vegetation.

Control of knapweed on City Open Space will probably be effected by the application of herbicides (most likely Tordon [picloram]). If the reintroduction of the grouse were delayed until the City has reduced the knapweed population to an acceptable level, we would avoid exposing the grouse to toxic herbicides. The Department has tried to effect control of knapweed via hand pulling, grazing by cattle. These techniques have been somewhat productive, but there is no effective alterative to herbicide application for control of diffuse knapweed.

We anticipate using alternates to herbicide for weed controlas they become available. Biological control agents (both insects and fungi) are available sporadically from the USDA through the Colorado Department of Agriculture. However they are not currently available in sufficient numbers to meet the present need. The Division of Wildlife might be able to work with the Department of Agriculture to make the insects available on a priority basis for use in connection with the recovery project. Nevertheless, it is unlikely that control of diffuse knapweed will be achieved without any use of herbicides.

Another cause for the decline in plains sharp-tail grouse numbers over the last century has been the eastward migration of the ponderosa pine (*Pinus ponderosa* Douglas) forest. Public sentiment in the Boulder area has not supported the elimination of ponderosa pines from open space lands. The role of fire in foothills ecosystem is poorly understood by the general public. Public education will be critical to the success of any plan to use prescribed burns (or any means) to control ponderosa pine. Based upon our own experiences, we urge you not to underestimate the magnitude of the pro-tree sentiment.

While prescribed burns may a useful management tool, they may not be feasible in many areas due to residential development along Open Space boundaries and air quality regulations. Any plans for controlled burns would need to be reviewed, approved and supervised by the City's wildland fire coordinator.

We have other comments about the recovery process that involve specific land management issues. Some of these may be specific to City Open Space, others may have broader implications for the recovery plan. The decision of whether or not you choose to address these issues in the recovery plan rests with you. However, we would like to make you aware of the concerns which the City and the Division of Wildlife will probably want to address when we negotiate an intergovernmental agreement.

Livestock Grazing

It is certainly hoped that some of the grouse released at the Rocky Flats site will disperse and find suitable habitat on City of Boulder Open Space. According to what is known about plains sharp-tail grouse habitat requirements, much of the most suitable

potential habitat occurs on properties leased to local ranchers. The Department works with these ranchers to achieve weed control and other management goals, including wildlife habitat manipulation, through the conditions of the leases. As we proceed to implement the recovery plan, we will need to work with these lessees to devise a appropriate grazing programs.

In the recovery plan there are many references to livestock grazing and grazing management. In fact, the development of grazing prescriptions is given a ongoing budget from the outset of the recovery program. However, it seems that research to evaluate the effect of grazing systems on grouse habitat is not funded until the fifth year of the program--yet it is given a considerable higher priority. We share your concern that grazing recommendations will be integral to habitat management, but are concerned that not enough is currently known to make such recommendations.

For example, light summer grazing would probably be inappropriate if late season tallgrass species are important components of the plant community. Summer grazing would leave residual spring cover for a couple years, but would eventually shift the species composition to short or mid-grass species that would not provide the necessary residual cover. Elimination of grazing might work in some upland areas, but our experience indicates this could lead to serious weed problems in moister bottomlands.

All of the leased City Open Space south of Baseline Road are currently under Great Plains contracts. We support your recommendation to work with the SCS to provide these recommendations through the GP program; but again stress the importance of having meaningful data upon which to base such recommendations. To the degree possible, the Department would like to work with the Division of Wildlife to help develop such grazing recommendations.

<u>Open Space Weed Management</u>

The Department does not manage native plant species as weeds however, several non-native species will be managed to reduce the threat to natural values. Herbicides will not be the control method of choice for all noxious weed species, and alternative methods will always be considered first. It would be useful to better understand the recommendations of the Division of Wildlife regarding herbicide application in potential plains sharp-tail grouse habitat involved in the recovery plan.

Russian olive (*Elaegnus angustifolia* L.) is among the weed species which the Department controls. It is also listed as a food plant for plains sharp-tailed grouse. The detrimental effects upon wildlife and native plant species resulting from Russian olive infestations of riparian areas are severe. Unless Russian olive has been found to be of extraordinary and overwhelming importance to plains sharp-tail grouse; the Department will continue its efforts to eradicate Russian olive on land it manages.

Management of Other Species of Concern

Management requirements for plains sharp-tailed grouse habitat are not necessarily compatible with management requirements for the Ute Ladies Tresses orchid (*Spiranthes diluvialis* Sheviak). The orchid is proposed to be listed as threatened under the provisions of the federal Endangered Species Act. Listing by the US Fish and Wildlife Service is expected in February of 1992. The status of the orchid requires that its habitat needs take precedence over those of the grouse when they both cannot be accommodated in the same geographic area.

The staff of the Open Space/Real Estate Department is excited about this project. Staff anticipates playing an active role in this excellent opportunity to contribute to the successful reintroduction of the plains sharp-tailed grouse into its historic range in Boulder County. I look forward to working with you on this project as it progresses.

Sincerely,

Mark Gershman
Wetlands/Wildlife Coordinator

cc: Delani Wheeler
Greg Toll
Tamara Naumann

DENVER AUDUBON SOCIETY
3000 S. Clayton St., No. 207 • Denver, CO 80210 • (303) 757-8376

January 4, 1992

Dr. Clait E. Braun
Colorado Division of Wildlife
317 W. Prospect
Fort Collins, CO 80526

Dear Clait:

Thank you for sending us a copy of the draft recovery plan for plains sharptail grouse. I have read it through and have a few comments.

Goals. The downlisting from endangered to threatened status depends on having 5 discrete occupied areas of at least 12 mi.^{2}, of which two are to be under DOW control, supporting an estimated minimum breeding population of 100 grouse for 3 consecutive years (p. 13). Nothing is said about control of the other three areas, but they too need to be under some kind of long-term ownership or management that will secure the habitat for this species, before downlisting can occur. The areas could be publicly owned and managed (by the DOW, a city or county, the federal government, etc.); privately owned but under a long-term conservation easement from some public entity; or privately owned and managed by an organization whose goals include preservation of biological diversity (e.g. The Nature Conservancy). I suggest simply adding, after "Colorado Division of Wildlife" a phase like "and all must be under a management regime that will enhance and protect grouse habitat in the long term." If three of the five areas are not under long-term protection achievement of the downlisting goals could be negated in a matter of weeks.

The goals for downlisting from threatened to species of special concern should include a similar clause for the 8 areas specified.

Habitat Management. Although Douglas County contains all the active leks found in the 1986-91 surveys, the goals for habitat management (p. 15 - 19) don't include any mention of close cooperation with County administration. (Perhaps this is already underway and mentioning it didn't seem necessary. I still think putting it in the recovery plan would serve the useful function of emphasizing it). DWM Jeff Rucks has evidently been working with the county planning office. Does the DOW also suggest zoning restrictions or easements when appropriate? A short addition is in order here, such as "Work with personnel of the Douglas County administration to enhance planning to preserve plains sharptail habitat in the County."

Transplants. Developing post-release procedures (p. 23) ought to include an estimate of how much manpower (full-time, part-time) will be required for these activities.

continued

Public Education and Watchable Wildlife. It's very encouraging to see a section like this included in a recovery plan. I couldn't think of anything to add to it.

One general comment: It's usually not very productive to go forging ahead with management of a species like this when, as the draft says, "many of the basic questions regarding sharp-tailed grouse biology remain unanswered." However it doesn't seem as though we have much choice in this case since the population levels have dropped to somewhat less than 200 birds, by your estimates. A strong research effort will be indispensable, and on behalf of the Denver Audubon Society I urge the DOW to make sure that research on this species gets full and adequate funding. Meanwhile management decisions will have to be made on the best information available, even if it is less than complete.

Thanks again for the opportunity to comment.

Sincerely,

Polly P. Reetz

Polly P. Reetz
Conservation Chairperson

cc: Lois Webster, DAS
Robin Hernbrode, DAS

Denver Museum of Natural History

DEPARTMENT OF ZOOLOGY

10 December 1991

Clait E. Braun
Colorado Division of Wildlife
Wildlife Research Center
317 West Prospect
Fort Collins, CO 80526

Dear Clait:

Betsy Webb passed along a copy of the "draft" recovery plan for plains sharp-tailed grouse. Congratulations on a thoughtful and well-written plan. The following comments/questions occurred to me:

1) I recognize the expense of acquiring discrete recovery sites, but are only 2 sites controlled by CDOW enough during phase 1 (delisting to threatened status)? I suppose the answer depends on where (under whose control) the other 3 sites are located.

2) What do you know about genetic heterozygosity in "natural" sharptail populations? Are you assessing genetic characteristics of transplanted populations? The presence of interspecific hybrids complicates matters a good deal, but I'm left wondering about the viability of transplanted populations. The unknown status of the 1987-88 transplants in Las Animas County is a bit bothersome.

Sorry we couldn't get together in September for some collecting; I got caught up in my Rocky Mountain Arsenal fieldwork and an owl project I'm beginning in San Isabel NF. Maybe next year?

Good luck with your sharptail plan; if I can be of any further assistance, let me know.

Best regards,

Chuck

Charles R. Preston
Chairman of Zoology
and Curator of Ornithology

2001 Colorado Boulevard, Denver, Colorado 80205-5798 303/370 6387 Fax: 303/331 6492

January 23, 1992

Terrrestrial Resources
CDOW
6060 Broadway
Denver, CO.

Re: Plains Sharp-tailed Grouse Recovery Plan

The history of the Plains Sharp-tailed Grouse outlined in the Recovery Plan Draft is of a small, widely scattered population affected over the past century by more or less endemic land uses. Deveopment forces and competing agricultural practices are pressuring the population. However, this subspecies' existence in the "wild" outside Colorado is not presently endangered. We are dealing, then, not with a matter of species survival, but of geographical distribution and convenience. Restoring the Plains Sharp-tail to a range no longer ecologically viable should require more justification. The lack of success in past transplant attempts and the developing population in an area without managed intervention (Crook-Tamarac) suggest that an effort is being forced. Despite a body of existing research, "basic questions remain unanswered"(4.1), and yet a program with a $2 1/4+ million through FY 95-6 budget is proposed in the Plan. There is little assurance, justifiably, that this Plan has a chance of succeeding any more than one of modest research, monitoring, protection, transplants, and education. Do not existing endangered species statutes provide the mechanism to protect threatened populations? If so, those provisions should be invoked, and if such provisions are not applicable, perhaps too much energy is being invested in this quarter.

The dependence of sustained population existence on private land(5.1) suggests a concentration of effort in that sector. The range of those concerned should be expanded from individual land owners and groups like the Nature Conservancy to include Audubon Society chapters and other ornithologic groups, museum associations, academic groups, and local conservation jurisdictions. Economic assistance from these areas should be solicited. The education and cooperation of the private landowner will obviate the need to put more land, and its accompanying expense, in the public domain. Perhaps a custodial attitude similar to that afforded prairie chickens can be fostered. Further, use of existing Federal, State, and local public land should be optimized before consideration is given to purchasing more.

The Plains Sharp-tailed Grouse is a bird with needs and problems similar to other upland species; sections 1 through 5 can be applied to all those species. The "aesthetic, ecological and economic value"(pg 15) of this "unique bird"(5.2) is not identified in the Draft, nor are the needs mentioned in 5.11. The high demand for programs(5.2) is surely relative, but to what standard? What, then, is the basis for this subspecies priority? The proposed cost of restoring and promoting this subspecies by this Recovery Plan immediately calls into question the CDOW committment to non-species-specific upland habitat management. Efficient use must be made of existing resources and a clear picture of the place of this bird in the overall management plan should be given.

These comments are respectfully submitted personally and on behalf of the United Sportsmen's Council of Colorado.

January 23, 1992

RE: Plains Sharp-tailed Grouse Recovery Plan

The DOW Upland Bird Management Analysis Guide 1991-5, Second Draft, July 1991 is the most current document publically available concerning that area to my knowledge. I obtained my most recent copy within the past three weeks. The number one Potential Issue in the section on plains sharp-tailed grouse in that document is "there is no approved recovery plan" (pg 81). Now comes the Plains Sharp-tailed Grouse Recovery Plan, Third Draft, Dec. 1991. This completed plan "has been approved by the Colorado Division of Wildlife" (Preface, pg iii). I think there is a question of openness on the part of the Division.

Significant features of the Recovery Plan include:

1) A budget of $2 1/4+ million for FY 92-6, $30,000 actually expended FY 91-2, and $400,000 for years 5-15, all exclusive of permanent FTEs and salaries. Incidently, the yearly totals were not printed in the spreadsheet. Over $540,000 expended for each of the next four years is more than the commitment of funds, exclusive of cost-share programs, for all of eastern Colorado upland habitat as presented thus far in meetings with the DOW.

2) Acquisition of properties by the DOW specifically for sharp-tail habitat. The acquiring of property for other upland species is not a priority, and, we have been led to believe, is not a DOW policy. Buying ground for bird habitat has been characterized as cost-prohibitive by DOW personnel.

3) Budgeted costs of +/- $3 million for the Recovery Plan will come from the Cash Fund. The plains sharp-tail is a non-game species (NO HUNTING) in Colorado having been classified as endangered in 1976. This program generates no revenue, so small game, big game, and fishing revenues will supply the money. How are any net gains in game programs to be realized with such diversions. The DOW has been forecasting declining hunter numbers with declining revenue. This means increasing license costs without alternative funding sources, which means fewer hunters, which means less revenue.....

4) Species-specific management. The director of the DOW has ordered that upland habitat management programs be non-species specific, a position put forth at the NE Colorado Pheasants Forever Midwinter Habitat Meeting 1/11/92, yet here it is. It also involves the acquisition of land to manage a particular subspecies even though existing Federal, State, and local jurisdiction lands in historical habitats are identified.

5) Plains sharp-tails have historically had only a small and widely-scattered population in Colorado and have been rare since the turn of the century (pg 10, Recovery Plan). Plains sharp-tails are not endangered through the rest of their range. How, then, is this sub-species afforded its apparent priority.

6) "Basic questions remain unanswered"(pg 23, sec 4) concerning grouse biology despite an exisitng body of research and the DOW's prior work. Management direction and techniques will develop as experience is acquired. At best, the Recovery plan is posited on an incomplete and apparently unknown foundation; less encouraging are implications regarding the quality of DOW research and interpreations thereof. What, then, is the justification for creating a uniquely Colorado laboratory for further studying this bird. The DOW says Colorado is on the fringe of pheasant range, pheasant habitat is marginal, and interest is declining, thus any direct program enhancement is unwarranted. Yet here is a program developed specifically for a bird on the fringe of its range, suffering from habitat deprivation, and little known in the State.

7) DOW research indicates previous plains sharp-tail transplants in Colorado have not succeeded. There is, however, a population developing in the Crook-Tamarac area (pg 11) unaided by management intervention. Does not this irony contribute to a sceptical attitude. Perhaps other undiscovered populations exist as sightings are occasionally reported in other eastern Colorado counties. The Tamarac group is reported to be hybridizing with prairie chickens so there is also a question of species integrity. With ecological factors apparently affecting cross-breeding, how is genetic purity to be maintained in the wild, and should we even attempt to regulate that development. Some significant philosophical questions have been answered by DOW direction.

8) The DOW assumes all aspects of direction and implementation for this program. In other upland areas, habitat location, development, fund-raising, and labor have been remanded to the private sector: land-owners and conservation groups. Is there a change in direction for allocation of resources and program development?

Efficient use must be made of existing resources (what about invoking endangered species legislation to protect a threatened population from development), and a clear picture of the place of this bird in the overall management plan should be given. Then, perhaps, the DOW can present a more reasonable approach to dealing with Plains Sharp-tailed Grouse.

Respectfully submitted personally, as a director of the United Sportsmen's Council of Colorado, and as a director of the Mountain/Plains Chapter Pheasants Forever.

[redacted]

000

February 10, 1992

[redacted]

Dear Clait,

Thank you for responding to my comments on the Sharp-tail Grouse Recovery Plan. Though some of my remarks deal with the endangered species aspect of the Plan, the areas of more immediate concern lie elsewhere. I would like to ask, however, whether the intent of the Endangered Species Act mentioned on page 1 of the Plan Introduction is DOW policy by administrative directive or mandated by law.

To reiterate, I was amazed by the fiscal aspects of the Recovery Plan given other budget restraints and stated policy considerations. I was further perplexed by objective 2 (pg 2) to downlist the subspecies from endangered given your comments regarding the prospects of doing the same for prairie chickens. The Plan thus seems unrealistic and exaggerated in its proposals. Perhaps the Plan is more political than objectively scientific in nature, a mixture not likely to garner the overwhelming support of the DOW's "traditional publics" considering the feeling of many sportsmen about the Division's political direction. DOW management and policy are reflected in such documents as the Recovery Plan and should be subject to comment in connection with a particular issue. We are not, of course, debating the value of habitat conservation, but rather an assignment of resources and priorities and a form of communication that is open, honest and direct.

In the interest of communication, I would suggest there is a need for some mechanism to make the existence of items such as the Recovery Plan more widely known, perhaps a subscription mailing list similar to that maintained for Commission regulations. "Seek and discover" and "grapevine" information are not efficient in this area, nor do those processes foster a feeling of involvement and cooperation.

Yours truly,

[redacted]

March 13, 1992

Plains Sharp-tailed Grouse Recovery Team
Wildlife Research Center
Ft. Collins, CO 80526

Re: Plains Sharp-tailed Grouse Recovery Plan, Final Draft

At this point, I remain unconvinced of the severity of the problem this document addresses and the need for the relatively massive approach proposed as the means to recovery. All the economic factors and public demand expectations are suspect. Would that all our enterprises received the attention and effort indicated in the Plan, and that we could afford them.

Yours truly,

Ed Roh

[redacted]

United States Department of Agriculture

Animal and Plant Health Inspection Service

Plant Protection and Quarantine

143 Union Blvd.
Suite 420
Lakewood, CO 80228

December 26, 1991

Clait E. Braun
State of Colorado
Division of Wildlife
Wildlife Research Center
317 West Prospect
Fort Collins, CO 80526

Dear Clait:

I have reviewed the plains sharp-tailed grouse recovery plan and, as per our telephone conversation on December 10, 1991, I have no problems for the grasshopper control year of 1992 abiding by the restrictions on page 18, in the designated area of Douglas County (page 5). I would like you to consider the use of Carbaryl (Sevin 4 Oil) at 20 ounces per acre in these areas. You listed Malathion as the pesticide of concern. Carbaryl could be substituted. I would also like to note that there are no biological control methods that would alleviate a major grasshopper infestation problem.

We will be glad to work with the Division of Wildlife in years to come and will evaluate each location as the grasshopper populations increase. To my knowledge, for 1992, we have no reason to treat the Rocky Flats area for grasshoppers. Per our telephone conversation, I want to emphasize APHIS' desire to work with the Colorado Division of Wildlife in meeting your goals and still effectively controlling grasshopper populations as the needs arise.

Please feel free to contact me at any time at (303) 236-0346.

Thomas D. Crowe
Officer-in-Charge

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM E200C
655 PARFET STREET
LAKEWOOD, CO 80215-5517

SUBJECT: Final draft, Plains Sharp-tailed Grouse Recovery Plan

DATE: March 16, 1992

TO: Clait E. Braun
Wildlife Research Center
317 W. Prospect Road
Fort Collins, CO 80526

FILE CODE: 190-13

I have reviewed your Final Draft of the Plains Sharp-tailed Grouse Recovery Plan and have the following comments:

On page i, item #2 it reads like all livestock grazing is detrimental to the recovery plan. On the bottom of page 8 and the top of page 9, the document basically states intensive livestock grazing is causing problems for this species. I would like to see this clarified to state that overgrazing is the problem. A livestock producer, with proper management, may practice intensive grazing practices, that in some instances, result in a shift from short to midgrass species. This type of shift should result in improved habitat for the species. Finally, midway down page 10, I propose changing the wording to the following: "Management should include changing domestic livestock grazing practices to increase residual herbaceous cover, etc."

Overall, the plan seems workable and a good effort.

Lee E. Hill LH.

LEE E. HILL
State Resource Conservationist

Enclosure

cc: Terri Skadeland, SCS State Biologist Lakewood, CO.

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
FISH AND WILDLIFE ENHANCEMENT
Colorado State Office
730 Simms Street, Suite 290
Golden, CO 80401

IN REPLY REFER TO:

6 January 1992

Clait E. Braun
Wildlife Research Center
Colorado Division of Wildlife
317 W. Prospect
Fort Collins, CO 80526

Dear Clait:

Following are some comments, observations and questions concerning your draft recovery plan for the plains sharp-tailed grouse. It appears that this document has already been in the mill awhile, so we assumed that at this stage you were more interested in substantive comments than detailed editing. Therefore, we made no attempt to edit, but simply noted things that stood out as we read through the document. To avoid confusing and bulky references to specific spots in the documents we have enclosed copied pages with these minor notations.

We do have a few comments and questions of greater substance, especially regarding the recovery goals and the stepdown plan. In reading through these sections there was some confusion over target population sizes and size of conservation areas.

1. In your recovery goals you set minimum populations of 100 birds. Yet just above you reference Toepfer et al. (1990) who recommends 200 breeding adults for a self-sustaining population. This appears to be a discrepancy; if not, it needs clarification. What was the basis for minimum population size determination? Have there been any genetic modeling efforts to aid in population size determination?

2. In your recovery goals you establish a minimum size for occupied recovery areas of 12 mi_2 (7680ac) each. But under 1.2 you have a stated goal of acquiring limited management rights to parcels of at least 3,000ac each. Why the significant difference? Is this even 3,000ac each? Or is it 3,000ac total between the two areas? We're not sure.

3. One criteria established for downlisting is population stability for 3 consecutive years. Such stability would indicate some level of continuity of land use during that time frame. Does this criteria need perhaps some assurance or indication of future land use planning to justify assumptions that such population stability is

likely to continue? In other words, in addition to past performance there needs to be some means of predicting that suitable habitat conditions are likely to remain into the foreseeable future. This would seem to be a key prerequisite to downlisting.

4. A second downlisting criteria is the establishment of populations at least 20 miles from the closest other occupied area. Presumably this is designed to protect populations against catastrophic or other highly negative events and circumstances. However, as written, this criteria would seem to preclude range consolidation, which should be a highly desirable ultimate goal. It may also limit options of utilizing the best available habitat. If this is simply a front-end goal during population establishment, perhaps that needs to be clarified. Maintaining isolated populations may require hands-on manipulation to assure adequate genetic diversity.

5. A third criteria for downlisting is the acquisition by DOW of 2 of 5 occupied sites in order to downlist to threatened status, and 4 of 8 sites to downlist to special concern status. Again, the apparent discrepancy between the minimum 7680ac and 3000ac/1500ac conservation areas needs to be rectified. Also, control of only 2 and 4 sites for meeting downlisting goals seems tenuous. Do you have some mechanism in place to offer some habitat assurances at the other sites not directly under DOW control?

6. In 1.21 and 1.22 your goal is to gain limited control of at least 2 areas each. We are uncertain of each what - long-term and perpetual easements?

7. Also, the purpose of the limited surface control is the ability to restrict grazing, and for public viewing opportunities. Is the ability to restrict grazing adequate or do you need the ability to undertake further habitat management on a case-by-case basis?

8. There is no mention of hunting in the recovery plan. Do recovery goals include a huntable population in the future? Or is habitat considered too limiting to achieve that level of recovery? Perhaps this should be addressed in the plan.

9. On pg. 14, paragr. 2, Rocky Flats is recommended as a reintroduction site. Contamination at the Flats is alluded to in this statement, raising a red flag. There is, however, no further discussion of the contamination issue. Presumably the issue and any potential problems with contaminants has been evaluated and received due consideration internally within your team. This

evaluation probably should be addressed in the document. If such an evaluation has not been made, it needs to be. The reader needs to know that potential contaminants (particularly heavy metals and radionuclides) questions have been asked and answered. Sufficient evaluation is necessary to support a conclusion that contaminants are unlikely either to present problems to the site reintroduction itself, or to introduce contaminants problems beyond site boundaries. Some sort of monitoring effort may also be desirable to verify reality against expectation. Further, in the event that a contaminant problem is discovered at some future time, a response plan should be in place and identified in the recovery document (if Rocky Flats is identified as a specific reintroduction site in that document). John Wegrzyn of our Golden office (231-5280) is a contaminants specialist working on Rocky Flats issues. If he can be of any help on this matter, please feel free to contact him.

10. On page 11, paragraph 3, regarding the statewide population estimate. A maximum figure of 148 is given based on 5 active leks. Yet it is stated that "it is doubtful all active leks were located." Is 148, therefore, a conservative rather than maximum high-end value?

11. Your step-down recovery plan seems to come out of the blue on page 15. Perhaps it needs more separation from the above discussion and a lead-in as to what follows.

12. You have addressed areas and specific sites suitable for population establishment and some means to attempt acquiring partial management capability, or to encourage landowner management for the sharp-tailed grouse. Has there been any assessments/projections as to the degree of success that DOW can expect in these attempts? What are reasonable, rather than just minimum, population goals? Is such a projection possible at this time?

13. Is there any strategy for range consolidation following the successful establishment of the required discreet populations? This would seem to be important, especially in light of development pressures in prime sharptail range. Are there any special plans for balancing the consolidation of sharptail range with current and planned development?

14. Access to lek sites by the public in order to view the birds has been identified in the recovery document as an important goal of the recovery process. Involvement of public interest is no doubt an important element in developing the base of support necessary for successful recovery programs. However, because the habitat of this species is likely to always face the pressure of

development and suffer from fragmentation as a consequence; and due to the sensitivity and vulnerability of a species whose reproductive efforts center on the lek; public access should be carefully controlled. Leks crucial to population survival probably should not be publicized and used for this program. Division experience with public access to sage grouse leks should be valuable. Sharptail habitat may, however, continue to be more precarious than that of the sage grouse due to fragmentation and proximity to urbanization, and may require more caution in providing public viewing opportunities.

We want to thank the Division for the opportunity to comment on this plan, and wish for its complete success. Overcoming the extreme pressures of urbanization in the prime habitat of this bird would be a real success story. We hope the above observations are of some help, and if we can be of further assistance please let us know. If there are any questions regarding these comments please contact Gary Patton in this office.

Sincerely,

LeRoy W. Carlson

Ref: Patton: misc\grouse.com

File: Endangered Species: Plains Sharp-tailed Grouse

70/70